SECONDARY MEDICAL PRODUCTS

Solutions Start Here

VACUUM REGULATORS

Operating and Maintenance Instructions

V x x - x x x - x - x x - x

Shell Color
(Y = yellow)
(W = white)

Mode
(I = Intermittent)
(C = Continuous)

Gauge Range
(300 = 300mmHg)
(400 = 400mmHg)
(760 = 760mmHg)

Gauge Direction
(I = Counter Clockwise)
(U = Clockwise)

Adapter
(XX = No Adapter)
(OH = OHMEDA)
(CH = CHEMETRON)
(JS = JAPANESE STANDARD)
(DN = GERMAN STANDARD)
(BS = BRITISH STANDARD)
(DS = DISS STANDARD)

(T = trap)
(N = nipple)

Example
VYI - 300 - U - DS - T
Color: Yellow shell color
Mode: Intermittent
Gauge Direction: 0 - 300 mmHg
Gauge Direction: Clockwise
Adapter: DISS adapter
Bottom Fitting: Trap

* 0-400 mmHg only available in Counter Clockwise gauge

CAUTION: Federal (USA & Canadian) law restricts this device to sell by or on the order of a physician.

PLEASE READ THOROUGHLY AND FOLLOW DIRECTIONS CAREFULLY BEFORE OPERATING EQUIPMENT

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IMPORTANT: SAFETY INSTRUCTIONS

This manual provides you with important information about the Vacuum Regulators and should be read carefully to ensure the safe and proper use of this product.

Read and understand all the safety and operating instructions contained in this booklet before using this product. If you do not understand these instructions, or have any questions, contact your supervisor, dealer or SMP Canada before attempting to use the device.

⚠ **WARNING:** Indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.

ATTENTION: Indicates a potentially hazardous situation, which if not avoided, could result in minor or moderate injury.

CAUTION: Indicates a potentially hazardous situation, which if not avoided, could result in property damage.

RECEIVING INSPECTION

Remove the SMP Canada Vacuum Regulator from the packaging and inspect for damage. If there is any damage, DO NOT USE and contact your supplier.

ATTENTION:

It is crucial to allow the product to remain in the original packaging for 24 hours to adjust to room temperature before use.

INTENDED USE

The SMP Vacuum Regulator is intended to regulate a supplied vacuum pressure to the user's desired vacuum level. A gauge indicates the level of the regulated vacuum, which is adjustable by a regulated knob. **DO NOT** attempt to change, alter or modify the intended use of this product.

EXPLANATION OF ABBREVIATIONS

Abbreviation	Explanation
Lpm	Liters Per Minute
mmHg	Millimeters of Mercury
inHg	Inches of Mercury
kPa	Kilopascal

GAUGE RANGE & ACCURACY

Vacuum Regulator Model	Gauge Range	Gauge Accuracy
Continuous/Intermittent	0-300mm Hg	± 1.6%
	0-400mm Hg	± 1.6%
	0-760mm Hg	± 1.6%

FLOW RATES

Flow Rates: Continuous	Standard
VYC-300 & VWC-300	0-60 LPM
VYC-400 & VWC-400	0-60 LPM
VYC-760 & VWC-760	0-60 LPM

Flow Rates: Intermittent	Standard
VYI-300 & VWI-300	0-8 LPM
VYI-400 & VWI-400	0-8 LPM
VYI-760 & VWI-760	0-8 LPM

Vacuum Ports: 1/8 NPT female

MODES

Continuous

REG:		Allows degree of vacuum to be adjusted by use of the regulating knob.
OFF:		Suction is no longer on or being supplied to the patient.
FULL:		Maximum vacuum is administered to patient.

Intermittent

REG:		Allows degree of vacuum to be adjusted by use of the regulating knob.
OFF:		Suction is no longer on or being supplied to the patient.
INT:		Presets at 16 seconds ON and 8 seconds OFF.

OPERATING ENVIRONMENTAL CONDITIONS

Operating Environmental Limits:
Maximum 122°F (50°C) and Minimum 0°F (-18°C).

Recommended Environmental Operating Limits:
Maximum 84°F (29°C) and Minimum 55°F (13°C).

Storage Environmental Limits:
Maximum 140°F (60°C) and Minimum -4°F (-20°C).

Temperature Range:
Maximum 140°F (60°C) and Minimum -4°F (-20°C).

Humidity:
Max 95% Non condensing

OPERATING INSTRUCTIONS

CAUTION:
Inspect the vacuum regulator for visual damage before use, DO NOT USE if there are any signs of damage on the product.

NOTE:
It is highly recommended to use Overflow protection with the vacuum regulator (Safety trap, Bacteria filter, Canisters etc.)

Ensure that the SMP Vacuum Regulator is in "OFF" mode. Connect the SMP Vacuum Regulator directly into the vacuum outlet.

REG MODE (Regulated Mode)
Step 1: Turn the top knob to "REG" position.
Step 2: Block the bottom port of the SMP Vacuum Regulator.
Step 3: Using the Regulator Knob, set the desired Vacuum.
To ***INCREASE*** vacuum - Turn knob clockwise.
To ***DECREASE*** vacuum - Turn knob counter clockwise.

INT MODE **INTERMITTENT VACUUM REGULATOR ONLY*
Step 1: Turn the top knob to "INT" position.
Step 2: Always verify vacuum setting prior to performing any procedure.
Vacuum levels set in the "REG" mode will remain the same when switched to the "INT" mode; and vacuum levels set in the "INT" mode will remain the same when switched to the "REG" mode.

FULL MODE (Full, unregulated vacuum) **CONTINUOUS VACUUM REGULATOR ONLY*
Step 1: Turn the top knob to "FULL" position.
Step 2: Turn the top knob to "OFF" position to turn the Regulator off.

⚠ WARNING:
When turning the Vacuum Regulator to "REG" from "INT", "FULL" or "OFF", the vacuum level will return to its previously regulated setting. Vacuum may be set at inappropriate level for procedure.

Always confirm vacuum setting prior to performing procedures. The vacuum cannot be regulated when the top knob is set to "FULL" or "INT" position depending on the type of vacuum regulator.

REG MODE

Turn selector knob fully clockwise to the regulator mode and confirm vacuum setting before use.

FULL MODE

Turn selector knob fully counterclockwise for full vacuum and confirm vacuum setting before use.

INT MODE

Turn selector knob fully counterclockwise for intermittent vacuum and confirm vacuum setting before use.

Suction Tubing, which can be provided by SMP Canada, is required between the patient port of the canister, as well as between the outlet port of vacuum regulator and the collection jar. It is recommended by SMP Canada to use 45 cm of tubing from SMP Canada Vacuum Regulator to the collection jar and 180 cm of tubing from collection jar to the patient. Quarter inch connection tubing is recommended by NFPA.

Procedure Prior to Use List:

⚠ **WARNING:**

The following checklist is recommended prior to using this product on each patient. If the vacuum regulator does not pass one or more of the following tests outlined on the checklist, it should be inspected, repaired and/or replaced by a qualified individual.

The following tests must be done with a minimum supply vacuum of -53 kPa (-400mmHg):

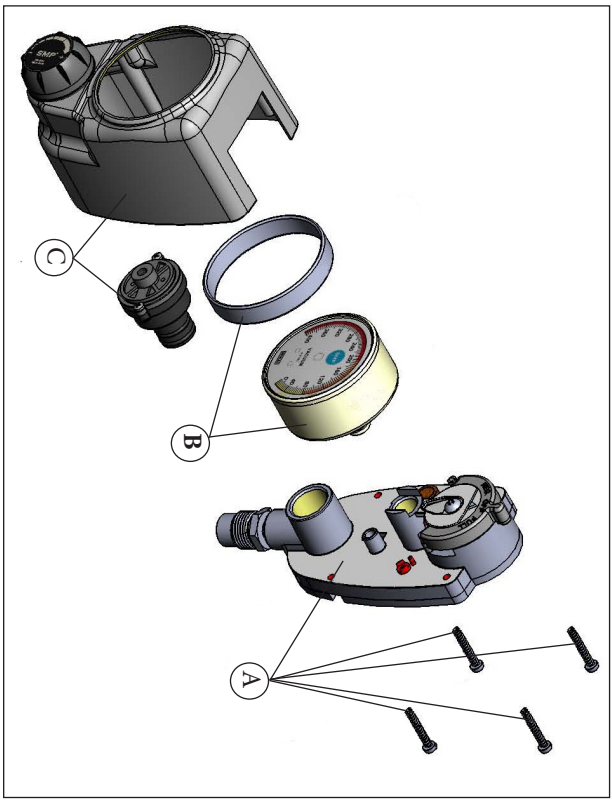
1. Move the selector switch to the "OFF" position. Turn the regulator knob one complete turn in the clockwise direction. Kink the vacuum tubing to block the outlet. There should be no movement of the gauge needle.

2. Move the selector switch to the “REG” position. Turn the regulator knob fully in the counter-clockwise direction. Kink the vacuum tubing; again, there should be no movement of the gauge needle.
3. Kink vacuum tubing.

Regulator Setting:
Increase the vacuum to -12 kPa (-90 mmHg)

4. Open and close the kinked vacuum tubing slowly to reach various vacuum rates. Ensure that the level of vacuum is staying consistent when the vacuum tubing is kinked.
5. Move the selector switch to the “FULL” position. Kink the vacuum tubing and ensure that the vacuum gauge is reflecting the maximum suction available.
6. Move the selector switch to the “REG” position.
7. Decrease the vacuum to zero and move the selector switch to the “OFF” position.

PARTS DESCRIPTION

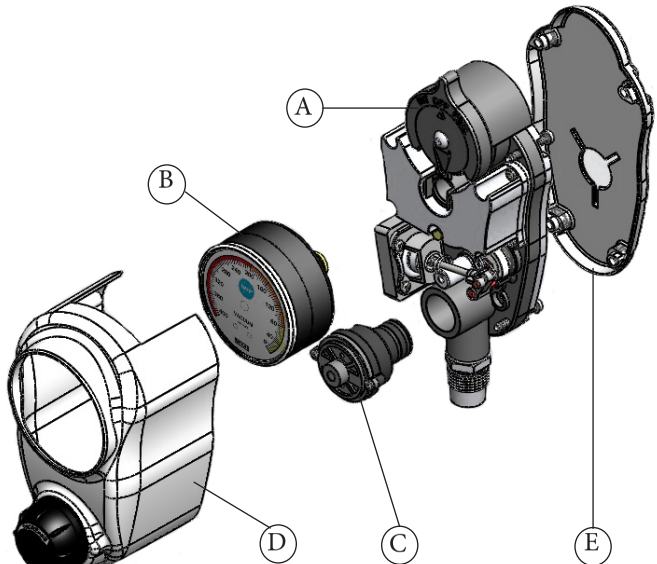


Continuous Vacuum Regulator

Continuous Vacuum Regulator

Item	Part No.	Description	Quantity
A	VRC-AFB	Back Body Set with Back Plate & Steel screws	1
B	VRC-G400-CC	Gauge 0-400 mmHg (Counter Clockwise) with Positional Ring	1
	VRC-G300-CW	Gauge 0-300 mmHg (Clockwise) with Positional Ring	
	VRC-G300-CC	Gauge 0-300 mmHg (Counter Clockwise) with Positional Ring	
	VRC-G760-CW	Gauge 0-760 mmHg (Clockwise) with Positional Ring	
	VRC-G760-CC	Gauge 0-760 mmHg (Counter Clockwise) with Positional Ring	
C	VRC-EDW	Protective Case - White with Flow Control Valve	1
	VRC-EDY	Protective Case - Yellow with Flow Control Valve	

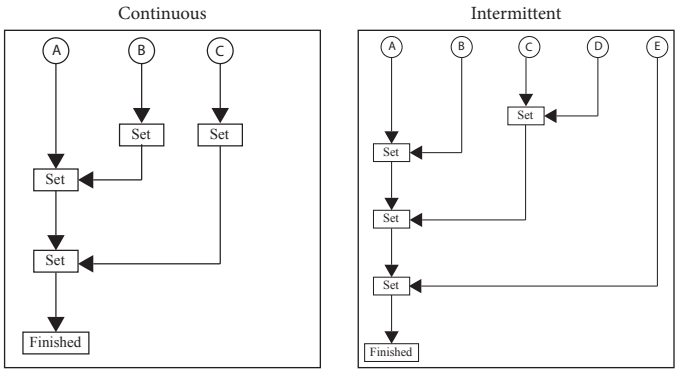
Intermittent Vacuum Regulator



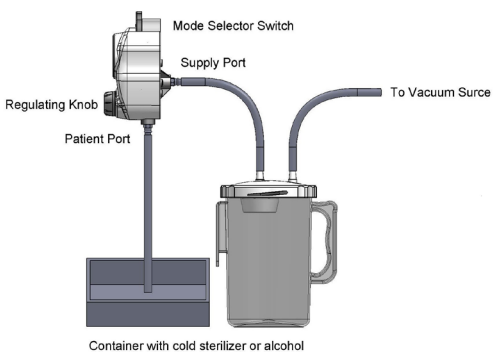
Intermittent Vacuum Regulator

Item	Part No.	Description	Quantity
A	VRI-BBS	Back Body Set	1
B	VRI-G400-CC	Gauge 0-400 mmHg (Counter Clockwise) with Positional ring	1
	VRI-G300-CW	Gauge 0-300 mmHg (Clockwise) with Positional ring	
	VRI-G300-CC	Gauge 0-300 mmHg (Counter Clockwise) with Positional ring	
	VRI-G760-CW	Gauge 0-760 mmHg (Clockwise) with Positional ring	
	VRI-G760-CC	Gauge 0-760 mmHg (Counter Clockwise) with Positional ring	
C	VRI-FCV	Flow Control Valve	1
D	VRI-PCW	Protective Case - White	1
	VRI-PCY	Protective Case - Yellow	
E	VRI-DPL	Decorative Plate	1

ASSEMBLY & DISASSEMBLY INSTRUCTIONS



CLEANING INSTRUCTIONS



1. Attach a working Vacuum Regulator with a continuous regulated mode to a minimum vacuum source of 15 mmHg.
2. Mix cold disinfection/sterilization solution according to its manufacturer's directions.

3. Connect tubing as shown in Cleaning Illustration on previous page.
4. Turn the working Vacuum Regulator on to a continuous regulated mode.
5. Adjust the vacuum to a minimum of 120 mmHg.
6. Set the Vacuum Regulator to be cleaned to the "REG" mode, and set at 100 mmHg.
7. Allow cold disinfection/sterilization solution to pass through and collect in Suction Canister. Procedure should continue for time recommended by the manufacturer of the cold disinfection/ sterilization solution for the desired level of disinfection or sterilization.
8. Turn the Vacuum Regulator to be cleaned to the "FULL " mode (if applicable).
9. Allow remaining cold disinfection/sterilization solution to pass through and collect in Suction Canister.
10. Set working Vacuum Regulator to its maximum vacuum setting.
11. Thoroughly dry the internal components by drawing maximum vacuum through the Regulator to be cleaned for at least 30 seconds in both "REG" and "LINE " modes (if applicable).

NOTE:
If it is not possible to pass cold disinfection/sterilization solution through the Regulator, then the passageways are totally blocked and **DISASSEMBLY** of the Regulator is required. Be sure to follow your facilities' Biohazard protocol.

MAINTENANCE

The following are recommended maintenance steps that should be taken after each patient:

1. Clean the exterior of the Vacuum Regulator with a solution of a diluted mild detergent.

2. Make sure all secondary apparatus such as canisters and tubing are thoroughly cleaned.
3. Inspect the bacteria filter. If it has been contaminated replace with a new one.
4. Inspect the overflow safety trap to make sure it is free of any restrictions.

TROUBLESHOOTING

Situation	Probable Causes of Situation	Manufacturer`s Recommendations
No Vacuum at Bottom port (Gauge reading at 0)	1. Loose connection. 2. Incorrect connection to vacuum source. 3. Clogged vacuum port.	1. Tighten Connection. 2. Correct connector should be used and connect to a working vacuum source. 3. Disassemble and clean the regulator.
No Vacuum at Bottom port (Gauge displaying Vacuum)	1. Clogged Regulator.	1. Disassemble and clean the regulator.
Gauge will not return to 0	1. Gauge is damaged. 2. Regulator module is damaged.	1. Replace gauge. 2. Replace regulator module.
Hard movement of Selector Knob	1. Dirty regulator module and/or selector module.	1. Disassemble and clean. 2. Apply some lubricant.
Vacuum at bottom port (No reading on gauge when port is blocked)	1. Defective Gauge. 2. Damaged regulator module.	1. Replace gauge. 2. Replace regulator module.
Under “REG” Mode the regulator cannot reach specified suction level	1. Low pressure. 2. Leakage. 3. Defective gauge. 4. Clogged Regulator.	1. Check the pressure at vacuum source. 2. Tighten all connections and block the bottom port of the regulator when adjusting pressure. 3. Replace gauge. 4. Disassemble and clean.

Under "REG" Mode the suction is too strong and cannot be reduced	1. Damaged Regulator Module.	1. Replace Regulator Module.
Under "FULL" mode the suction is not reaching full capacity	1. Low pressure. 2. Leakage. 3. Loose connection.	1. Check the pressure at vacuum source. 2. Check the pressure at zone valve. 3. Tighten all connection and block the bottom port when reading the pressure.
Fails to Cycle properly in "INT" mode	1. Timing circuit adjusted incorrectly. 2. Damaged mode switch O-Ring. 3. Clogged back plate filter. 4. Damaged timing assembly.	1. Adjusting timing control. 2. Replace O-Ring. 3. Replace filter. 4. Consult factory for service.

OVERFLOW SAFETY TRAP *(Optional)*

Purpose:

The SMP overflow safety trap serves an additional safe-guard to protect vacuum regulating devices and central gas pipeline systems from the accidental overflow of exudation from collection bottles.

Specification:

Bottle capacity: 80mL

⚠ WARNING & CAUTION FOR OPERATION

1. Only personnel instructed and trained in its use should operate this product.
2. Remove product from package and inspect for damage. Do not use if there is any damage.
3. The product would only work with the Vacuum Regulator in a vertical, upright position.
4. Be sure all connections are tight and leak free.
5. Do not use oil, grease, organic lubricants or any combustible materials on or near this product.

Operation Instructions:

1. Verify that the float moves freely in the trap by turning it upside down, and ensure the float drops back down to the very bottom once tuned back.
2. Connect the Safety Trap onto the bottom of a Vacuum Regulator. Screw the thread tightly.
3. Check the leakage by blocking the inlet port of the Safety Trap and turning on the Vacuum Regulator to desired level. Check all connections if the suction is not continuous.
4. Attach a suction system to the inlet port.
5. While excess exudation overflows into the trap during suction procedure, the float will elevate, blocking the ports to stop the suction.
6. To re-activate the suction, turn off the vacuum regulator first, empty the trap, and re-install the system again.

Maintenance:

1. Detach the container and clean it thoroughly for next use. Clean the cap with a cloth dampened with mild cleaning solution.
2. This product is autoclavable with high pressure saturated steam at temperatures of 121°C for 10 mins.
3. This product can be sterilized with E.O. Gas.
4. Do not clean with aromatic hydrocarbons or sterilize with Gamma Radiation.
5. Only qualified personnel should repair this product. Unauthorized disassembly or attempt to repair will cause damage to the product and void warranty.
6. Store the product in a clean area when not in use. Avoid extreme temperatures or humidity.

Expiration:

8 years from date of manufacture, 5 years warranty.

WARRANTY CARD

To validate your 5 year warranty, please fill out and mail this card to SMP Canada within 10 days from the purchase date

MODEL _____ SERIAL NO. _____

YOUR NAME _____

COMPANY NAME _____

ADDRESS _____

CITY _____ STATE / PROVINCE _____

ZIP / POSTAL CODE _____ PHONE _____

PURCHASED FROM _____

DATE RECEIVED _____

WC

PLACE
FIRST
CLASS
POSTAGE

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